The Stalker 'Bot

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TOOLS:

- Computer running Windows XP, Vista, or Mac OS X (1)
- USB cable, standard-A to mini-B (1)

PARTS:

- Small breadboard (RS : 276-003) (1)
- Arduino Uno microcontroller (1)
- Breadboard jumper wires, or solid core 22AWG wire (1)
- Battery holder, 6xAA (1)
- 9V battery (1)
- Batteries, AA (6)
- VEX Ultrasonic Range Finder (2)
- Keps Lock Nut 8-32 (4)
- Button Head Screw 8-32 x 0.625" (4)

SUMMARY

Gather the parts and follow the basic instructions and you can have a robot capable of following moving objects! With basic coding experience, you can also change the distance at which the robot senses moving objects or the speed at which the robot moves.

In order to do this project, a basic robot must be built that is powered by two 3-wire VEX servos. A good robot to build is the VEX Squarebot. Instructions for building this can be found under the Files section of this project or with any VEX robotics kit.

## Step 1 — Attaching the Ultrasonic Sensors
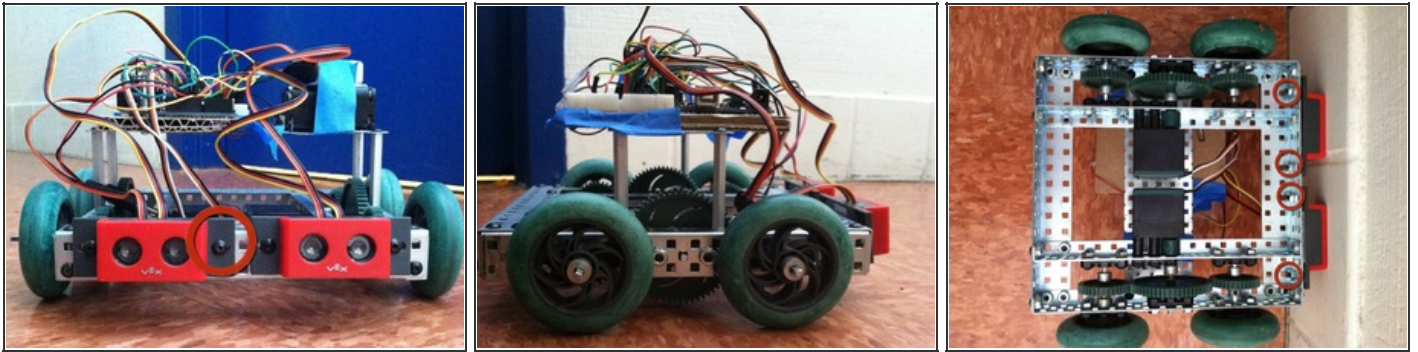
- Attach the ultrasonic sensors to the front of the robot side by side.

  - Use two screws per ultrasonic sensor, putting nuts on the back to hold the sensor onto the robot.

    - Use an Allen wrench to spin the screws in.

  - Make sure the ultrasonic sensors are facing up with the VEX lettering on the bottom.

- By adjusting the distance between the sensors, you can adjust how big of an object the robot will follow (a larger distance will make the robot follow a larger object).

Step 2 — Attaching Electrical Components
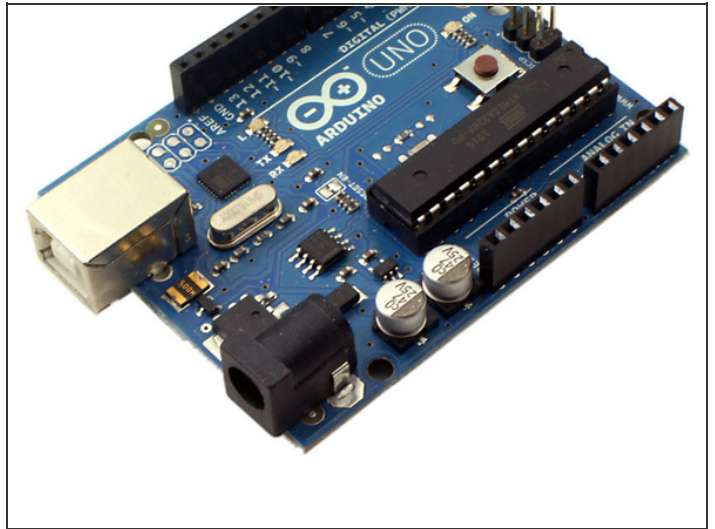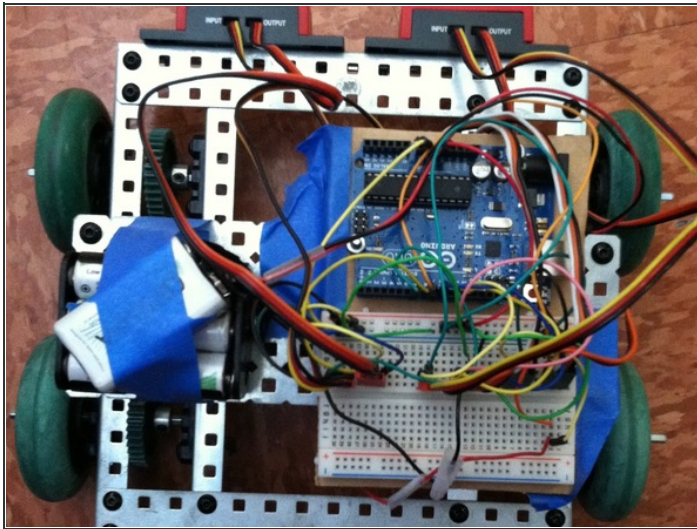
- Attach the following components to the robot, holding them down securely:

  - breadboard, Arduino, 6 AA battery holder, 1 9-volt battery

- Tape can be used to hold these components to the robot.

- Place the Arduino and breadboard next to each other to allow for wiring between them.

- For further guidance, see the StalkerBot_Diagram.pdf file in the Files section.

Step 3 — Wiring
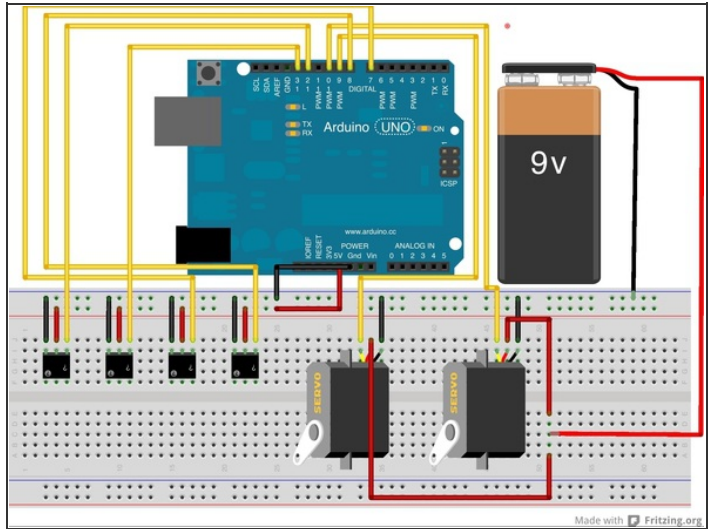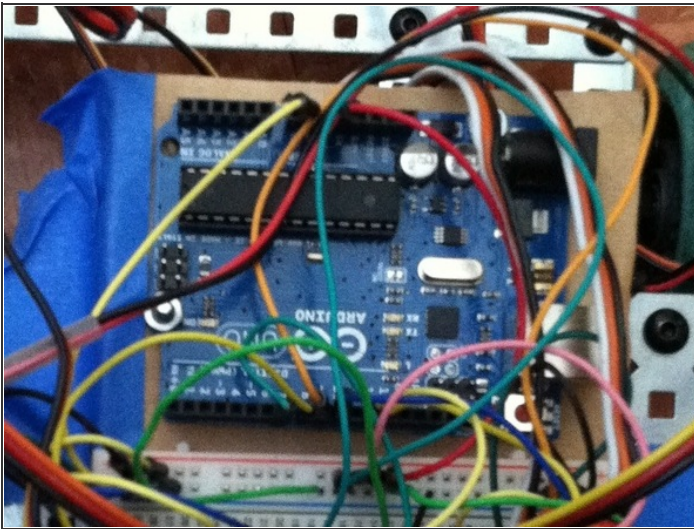
- The next step is wiring! Follow the wiring instructions exactly to get a functional robot.

- Using the StalkerBot_Circuit.pdf file as a reference (available in the Files section), wire each component to the Arduino through the breadboard.

  - Push the tinned ends of the wires (known as jumper wires) into the specified pinholes.

Step 4 — Programming
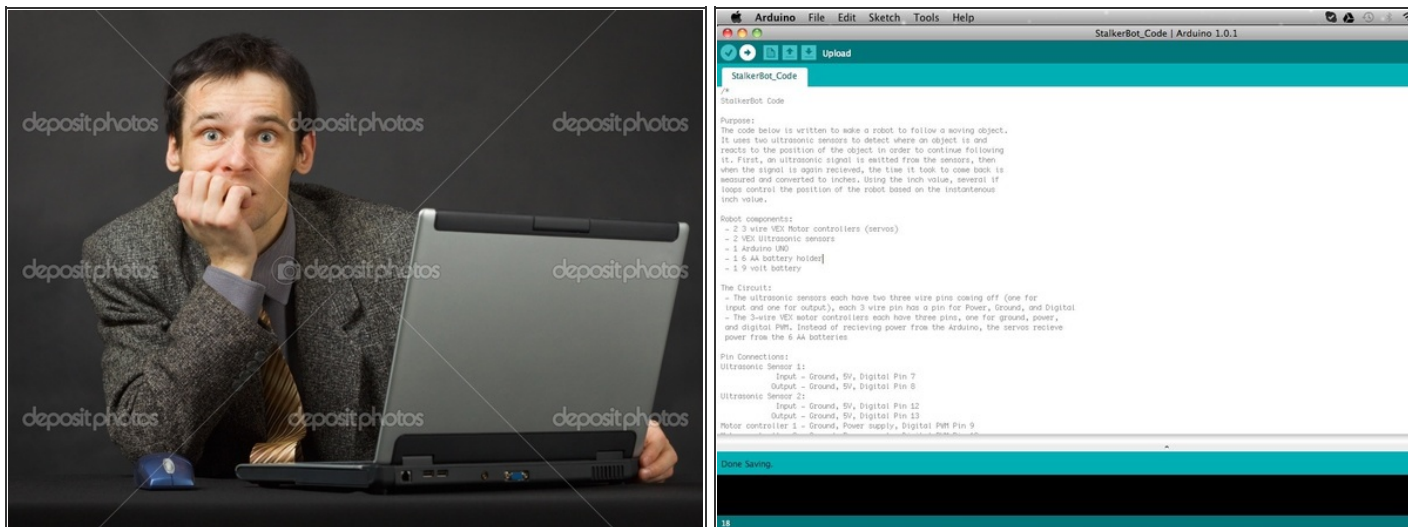
- Program the finished robot using the code provided in the file called "StalkerBot_Code.pdf".
  - Create a new Arduino program by going to **File→New** in the Arduino application.
  - Copy the StalkerBot_Code into the new Arduino program.
- Once the code has been entered into the Arduino IDE, connect a USB cable from the computer to the Arduino.
- Click the upload button in the Arduino window to upload the code to the robot.
  - Be careful: the robot will start running the code as soon as it is uploaded.

Step 5 — The StalkerBot!
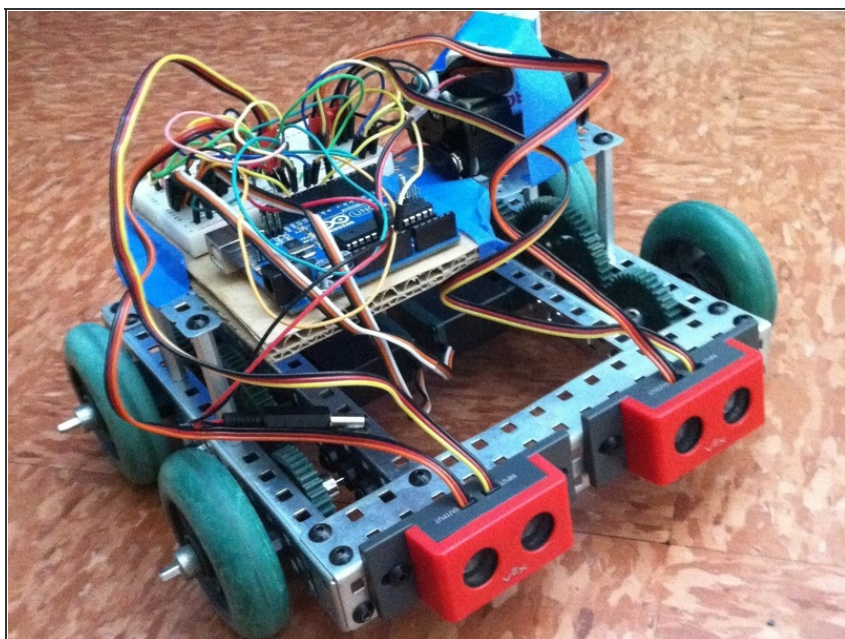
- The robot is now ready to use!
- To operate the robot without having a USB connection to the computer, connect the 9-volt battery to the Arduino's power input.

After completing this project, you will now have a functioning stalker 'bot! To adjust the distance that it senses objects from, edit the inch values in the Robot Control if loops in the program.

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